Maastricht University

Connecting two worlds

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Valorization Addendum

TARGET GROUPS

The influence of implicit cognitions is ubiquitous in our daily lives. Health behaviors, such as physical activity (Bluemke et al., 2010; Cheval et al., 2015; Conroy et al., 2010), smoking (McCarthy & Thompsen, 2006; Perugini, 2005), alcohol consumption (McCarthy & Thompsen, 2006), drug use (Rooke, Hine, & Thorsteinsson, 2008; Wiers, Gladwin, Hofmann, Salemink, & Ridderinkhof, 2013), or food choice (Deluchi, Costa, Friedman, Gonçalves, & Bizarro, 2017; Richetin et al., 2007) have been shown to be linked to people's implicit cognitions. Also other behaviors, such as voting behavior (Arcuri et al., 2008; Friese, Smith, Plischke, Bluemke, & Nosek, 2012), sustainability(-related) behavior (Panzone, Hilton, Sale, & Cohen, 2016), or consumer preferences (Dimofte, 2010; Friese et al., 2006) are related to implicit cognitions. Also, mental health illnesses, such as anxiety or depression, are connected to implicit cognitions. More precisely, anxious or depressed individuals show a strong tendency to attend to threatening or negative stimuli, respectively, which in turn strengthen the illness (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007; Gotlib, Krasnoperova, Yue, & Joormann, 2004; MacLeod et al., 1986). Furthermore, doctor-patient interactions (FitzGerald & Hurst, 2017; Green et al., 2007; Hoffman, Trawalter, Axt, & Oliver, 2016) or customer-client interactions are influenced by implicit cognitions. In July 2018, Starbucks Coffee closed more than 8.000 of its stores for a few hours in order to provide their staff with an implicit bias training concerning racial biases (Siegel, 2018). This was the consequence of an incident earlier that year, in which a store manager had called the police as two black men were sitting in the store without having purchased an order. White people, however, who were also sitting in the store without having purchased an order, did not suffer any consequences. This example demonstrates that implicit cognitions can be major influencers of our daily behaviors and Starbucks employees are surely not the only workers who demonstrate this. Further, it becomes clear that implicit cognitions have entered the mainstream and are no longer concepts discussed in the scientific context only.

So should all companies follow the example of Starbucks and offer an implicit bias training? It has to be made clear that changing implicit cognitions is not enough in order to change behavior. Although implicit cognitions are related to behavior, they are not the only determinants that influence behavior. Changing implicit cognitions can contribute to behavior change, yet they are not the only cognitions that should be addressed when aiming at behavior change as other explicit cognitions, such as explicit attitude, self-efficacy, or social norms are also important prerequisites for behavioral performance. Hence, the answer to the above-stated question should be "Yes, but this is not enough." As outlined in this dissertation, a change of implicit cognitions should ideally be combined with a change in explicit cognitions. Due to their omnipresence, the target groups concerning implicit and explicit cognition

modification are broad. One could think of health promotion interventions that are aiming to stimulate people to perform more desirable health behaviors. However, not only interventions that are concerned with reversing unhealthy behaviors into healthier ones might profit from this approach, but also preventive interventions, for instance aimed at individuals who are at a higher risk to develop unhealthy behaviors (e.g. based on age, socio-economic status, gender, lifestyle, or environmental factors). The same applies to the mental health sector. Not only individuals who already suffer from mental diseases might profit from an implicit and explicit cognition modification, but also subclinical individuals who show a strong attentional bias towards threatening or negative stimuli. It is likely that latter ones are at increased risk of making a transition from a non-clinical to a clinical state. In order to prevent this, early measures, such as implicit and explicit cognition modification, might be helpful. This might be especially attractive for health care insurances in order to prevent unhealthy behaviors to develop further and to save health care costs. Furthermore, in order to prevent or decrease racial behaviors (concerning gender, ethical background, or skin colour) organizations could also make use of implicit cognition trainings in addition to explicit measures.

INNOVATION

Previous research concerning the integration of implicit and explicit cognitions in the prediction of behavior focused mainly on the interplay between implicit attitudes and explicit attitudes. The approach of combining implicit attitudes with more explicit cognitions (besides explicit attitudes) in the prediction of behavior has not been followed extensively before. Moreover, intention has not been included in theoretical assumptions, although it forms one of the most important prerequisites for behavioral performance. The novel and innovative approach of combining implicit attitudes with more explicit cognitions in the prediction of behavior allowed us to better understand how the two different types of cognitions relate to each other as well as how they jointly determine health behaviors. Thereby the contemporary notion that behavior is a combined result of conscious and rather unconscious mechanisms was supported. Although implicit attitudes were not directly related to behavior, they were directly related to intention. Furthermore, they influenced the well-known relations between explicit cognitions and intention and behavior. This knowledge was undiscovered until now. Hence, both types of cognitions should be changed in order to achieve more effective outcomes concerning behavior change. As this approach is normally not followed in current interventions, future interventions should be informed by these findings and should apply this strategy to achieve even more successful outcomes. This might not only contribute to improved health and greater well-being in people but also to reduced health care costs.

ACTIVITIES AND PRODUCTS

The computer and the Internet have become a prominent device and channel to deliver interventions in a far-reaching as well as a cost-effective way (Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004). One intervention method that is used frequently is tailoring, meaning that depending on the individual's pre-existing cognitions, the individual receives tailored advice or tasks he or she has to perform to result in a change of specific cognitions. These types of interventions could be nicely complemented by evaluative conditioning tasks to steer not only explicit cognitions but also implicit attitudes into the 'right' direction. Also, the constantly growing dissemination and usage of smartphones in Europe and worldwide, make smartphones a promising channel to bridge the gap between the accessibility of interventions and their mobility. Apps based on gamification could offer an interactive, playful, and attractive way to deliver evaluative conditioning tasks and methods to change explicit cognitions. For example, Dennis and O'Toole (2014) developed a mobile game application based on the dot-probe task (MacLeod et al., 1986) in order to retrain attentional biases in highly anxious adolescents. More precisely, participants were shown two cartoon characters on the screen, which were presented in grassland. One character showed a neutral/positive facial expression whereas the other one showed an angry expression. Simultaneously, both characters burrowed themselves in the grass field and a trail of grass appeared only there, where the character with the neutral/positive expression was burrowed. Participants were asked to indicate this trail of grass as quickly as possible and it was demonstrated that the focus on positive/neutral faces resulted indeed in a reduced attentional bias. Although this app addressed attentional bias and not implicit attitudes, it is imaginable that similar applications could be used in order to change implicit attitudes. By this means, a broad target group could be reached.

Another approach to combine implicit and explicit cognition change is entertainment-education and serious gaming, which are both understood as an intersection between entertainment and education. Serious games can aim at behavior change and can at the same time be experienced as enjoyable and intrinsically motivating as they use certain techniques, such as the flow effect, reinforcement, goal-setting, positive feedback, or social connectivity (DeSmet, Shegog, Van Ryckeghem, Crombez, & De Bourdeaudhuij, 2015; Graesser, Chipman, Leeming, & Biedenbach, 2009). Thereby, rather repetitive tasks to change implicit attitudes could be delivered in an appealing and fun way. One example is the serious game 'Heroes of the night', in which implicit attitudes regarding protective sexual behaviors were addressed by means of different tasks, amongst others evaluative conditioning (Brüll, Hebecker, Wiers, Kok, & Ruiter, under review). More precisely, the avatar received positive or negative audio and visual feedback after having engaged in (un-)safe sexual behavior. Hence, the desired behavior was paired with something positive whereas the unwanted behavior was paired with something negative.

Taken together, serious games or apps based on gamification offer a richer and more interesting context to deliver implicit modification tasks, which might be perceived as rather repetitive and boring. Although the abovementioned applications are based on the original paradigms, there still appears to be a risk to lose some of the key elements of the original paradigms, when embedding them in a serious game (Boendermaker, Peeters, Prins, & Wiers, 2017). Thereby it is possible that the intervention/paradigm becomes less effective than the pure original paradigm itself. In order to rule out this risk, the effectiveness of these games should be compared to the effectiveness of the original paradigms before using them as a promising alternative. Another possibility could be to add game elements around the original paradigm, thereby leaving the task unchanged but still motivating the user by rewarding good task performance after his or her performance. Complementing these types of games with measures to change explicit cognitions offer a promising avenue for prospective interventions. It is now the task for future research to investigate the best method to create and deliver interventions that are able to change both explicit and implicit cognitions.